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large, academic, tertiary hospital with an 11-year historical look back (January 1, 2010 to December 31, 2020) to identify and characterize AAAs. Beginning January 1, 2021, a direct link between the NLP system and the EMRs enabled a real-time review of the imaging reports for new AAA cases. A nurse-navigator (1.0 FTE) used software filters to categorize the AAAs according to predefined metrics, including repair status, and adherence to the Society for Vascular Surgery imaging surveillance protocol. The nurse-navigator then interfaced with the patients and providers to reestablish care for patients not being actively followed up. The nurse-navigator characterized the patients as case closed (eg, deceased, appropriate follow-up elsewhere, refused follow-up), cases awaiting review, and cases reviewed and undergoing ongoing surveillance using AAA-specific software. The primary outcome measures were the yield of surveillance imaging performed or scheduled, new clinic visits, and AAA surgery for patients not being actively followed up. The contribution margin was the estimated revenue minus the direct costs.

**Results:** During the prospective study period (January 1, 2021 to December 30, 2021), 6,340,505 imaging reports were processed by the NLP (Fig). After filtering for studies likely to include the abdominal aorta, 243,889 imaging reports were evaluated, resulting in the identification of 5609 nondeceased patients with an AAA. When stratified by the maximum aortic diameter, 2324 AAAs were 2.5 to 3.4 cm, 478 were 3.5 to 3.9 cm, 521 were 4 to 5 cm, and 271 were >5 cm. In addition, 204 AAAs were saccular, 303 had previously received open repair, and 840 had previously received endovascular repair. The status for 688 AAAs was unknown. Of these, 1621 cases had been reviewed and closed, 1393 had been reviewed and placed in ongoing surveillance, and 2595 were awaiting review. This yielded 40 finalized imaging studies, 29 scheduled imaging studies, 29 new patient clinic visits, and 4 AAA surgeries among the patients not being actively followed up. The program generated \$60,032.24 in contribution margin.

**Conclusions:** Application of an AAA program leveraging NLP successfully identified patients with AAAs not receiving appropriate surveillance or counseling and repair. This program offers an opportunity to improve best practice-based care across a large healthcare system.

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#### S4: PLENARY SESSION 4

##### SS08.



#### COVID-19—Associated Acute Limb Ischemia During the Delta Surge and Effect of Vaccines

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**Objectives:** Hypercoagulability is common in SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) and has been associated with arterial thrombosis leading to acute limb ischemia (ALI). Our objective was to determine the outcomes of concurrent COVID-19 (coronavirus disease 2019) infection and ALI, particularly during the Delta variant surge, and the impact of vaccination status.

**Methods:** A retrospective review was performed of patients treated at a single healthcare system between March 2020 and December 2021 for ALI and recent (<14 days) COVID-19 infection or who had developed ALI during hospitalization for COVID-19. The patients were grouped by year and by pre- vs post-Delta variant emergence in 2021 using the World Health Organization timeline (January to

May vs June to December). The baseline demographics, imaging studies, interventions, and outcomes were evaluated. A control cohort of all ALI patients requiring surgical intervention for a 2-year period before the pandemic was used for comparison. The primary outcomes were in-hospital mortality and amputation-free survival. Kaplan-Meier survival and Cox proportional hazards analyses were performed.

**Results:** We identified 35 acutely ischemic limbs in 31 patients with COVID-19, most during the Delta surge (51%) and after the wide availability of vaccines. The incidence of ALI in the hospitalized COVID-19 patients, although low overall, nearly doubled during the Delta surge (0.35% vs 0.20%;  $P = .11$ ). The baseline demographics and comorbidities are summarized in the Table. Intervention (open or endovascular revascularization vs primary amputation) was performed on 26 limbs of 23 patients, with the remaining 8 treated with systemic anticoagulation. Postoperative mortality was 43%, and overall mortality was 45%. Major amputation after revascularization was significantly higher for those with COVID-19 ALI (odds ratio, 4.8;  $P = .006$ ) compared with the control group before

**Table.** Demographic data, comorbidities, vascular interventions, and ischemia staging stratified by coronavirus disease 2019 (COVID-19)

Factor	COVID-19 pandemic		P value
	Before	During	
Patients, No.	74	35	
Gender			<.001
Female	29 (39)	9 (26)	
Male	45 (61)	26 (74)	
Age, years	62.8 ± 14.4	69.4 ± 10.4	.017
Ethnicity			.042
White	65 (88)	31 (89)	
Black	7 (9)	0 (0)	
Hispanic	0 (0)	1 (3)	
Other	2 (3)	3 (9)	
Smoking status			.034
Never smoker	26 (35)	16 (47)	
Previous smoker	19 (26)	13 (38)	
Current smoker	29 (39)	5 (15)	
Comorbidities			
VTE	6 (8)	3 (9)	1.00
HTN	48 (65)	28 (80)	.12
DM	25 (34)	14 (40)	.53
ESRD	3 (4)	1 (3)	1.00
Dyslipidemia	29 (39)	12 (34)	.68
COPD	15 (20)	10 (29)	.34
Hypercoagulable disease	7 (9)	2 (6)	.72
Prior vascular intervention			<.001
None	44 (59)	25 (71)	
Endovascular	30 (41)	5 (14)	
Open	0 (0)	5 (14)	
Rutherford class			.30
Class 1	22 (30)	11 (31)	
Class 2A	31 (42)	10 (29)	
Class 2B	19 (26)	12 (34)	
Class 3	1 (1)	2 (6)	
Vaccination status	NA	1 (3)	

COPD, Chronic obstructive pulmonary disease; DM, diabetes mellitus; ESRD, end-stage renal disease; HTN, hypertension; NA, not applicable; VTE, venous thromboembolism.  
Data presented as number (%) or mean ± standard deviation.

the pandemic. The 30-day amputation-free survival was significantly lower for those with COVID-19 ALI (odds ratio, 0.20; log-rank  $P < .001$ ; Fig). COVID-19 infection (hazard ratio [HR], 2.5;  $P = .008$ ), older age (HR, 1.04;  $P = .004$ ), and higher Rutherford classification (HR, 1.7;  $P = .018$ ) were associated with decreased amputation-free survival on multivariate analysis. The severity of COVID-19 infection, defined as intensive care unit admission or intubation, was not associated with amputation after revascularization. We found a significant incidence of rethrombosis in the latter half of 2021 with the Delta surge because reintervention for recurrent ischemia of the same limb was more common than in our previous experience (33% vs 0%). COVID-19–associated limb ischemia occurred almost exclusively in nonvaccinated patients (97%).

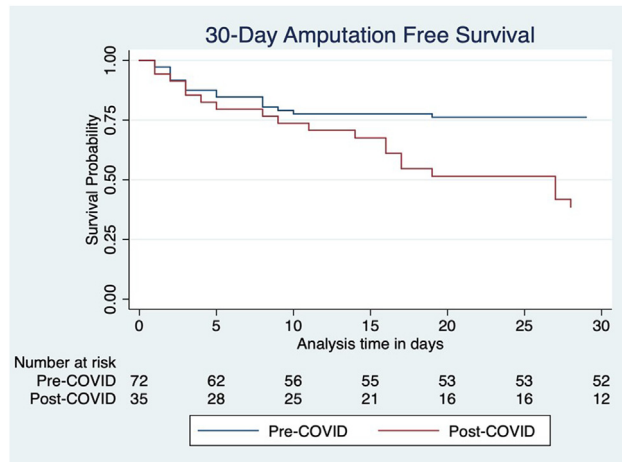


Fig. Kaplan-Meier curve for 30-day amputation-free survival.

**Conclusions:** ALI observed with the Delta variant appeared more resistant to standard therapy. Vaccination status appeared to be protective of ALI occurrence in the setting of COVID-19 infection. Information of limb loss as a COVID-19 complication among the nonvaccinated might help to increase vaccination compliance.

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## RS15.

### Improved Follow-Up After Hospital Discharge Does Not Impact 30-Day Readmissions After Vascular Procedures

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**Objectives:** We evaluated the integration of an automated patient contact system with a standardized process for in-patient discharge for successful transition to out-patient care.

**Methods:** All patients discharged from the vascular surgery service who underwent procedures from April 2021 through October 2021 with pre-discharge process improvement (PI) were included and compared with a historical cohort discharged from May 2018 through July 2019 (control). For both cohorts, all the patients had received an automated telephone call from a third-party vendor (CipherHealth, New York, NY), with an option to escalate to a clinical nurse. For the 2021 PI cohort, improvements in the discharge process were enacted, including standardized in-person discharge instructions by a vascular nurse coordinator and a more timely follow-up visit after discharge. The primary outcomes were unplanned

readmission within 30 days of discharge and the time from discharge to the post-discharge visit.

**Results:** A total of 469 patients who had received an automated telephone call (1.4 ± 1.0 days) after discharge were analyzed: 271 in the control group and 198 in the PI group. The mean age was 64 ± 16 years, and 65% were men. No significant change in the overall 30-day readmission rates was observed (11.8% control vs 10.6% PI;  $P = .7$ ). A request for escalation to the clinical nurse was significantly less frequent after the intervention (28.0% control vs 16.7% PI;  $P = .004$ ). Escalation was associated with increased 30-day readmissions (8.6% vs 20.1%;  $P = .001$ ) for all patients. Direct telephone calls were made to patients considered at a high risk of readmission (2% control vs 43% PI;  $P < .001$ ) regardless of escalation status. On multivariate analysis (Table), escalation and direct telephone calls were each independently associated with readmission. Two thirds of the readmissions had occurred before the scheduled post-discharge visit, with a median interval from discharge to readmission of 8 days (interquartile range [IQR], 5-13 days). The median interval from discharge to the post-discharge visit was markedly improved with PI (control: median, 24 days; IQR, 14-33 days; vs PI: median, 16 days; IQR, 11-32 days;  $P = .007$ ). Compared with the control group, the median interval from discharge to the post-discharge visit with escalation was not significantly improved (control: median, 18 days; IQR, 14-28 days; vs PI: median, 15 days; IQR, 9-36 days;  $P = .3$ ).

**Conclusions:** Restructuring the discharge process decreased escalation to clinical staff from the automated post-discharge telephone call and improved the incidence of early post-discharge visits. The 30-day readmission rates remained unchanged despite these efforts and was increased for patients requesting escalation. These findings support the benefits of a structured discharge approach for post-discharge transition of care and suggest that other actionable factors are required to decrease readmissions after vascular procedures.

Table. Factors associated with 30-day readmission

Variable	OR	95% CI	P value
Escalation to clinic nurse	2.11	1.12-3.97	.02
Direct call	2.62	1.03-6.68	.04
Process improvement	0.57	0.24-1.34	.2
Age	0.99	0.97-1.01	.4
Male gender	0.99	0.54-1.81	.2

CI, Confidence interval; OR, odds ratio.

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## RS16.

### Functional Status After Lower Leg Fasciotomy for Acute Compartment Syndrome: A Single-Center Review

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**Objectives:** Acute lower leg compartment syndrome can result in limb loss after emergency revascularization procedures. Although a fasciotomy can relieve intracompartmental pressure, not all patients will achieve full functional recovery. The factors that affect the outcome after emergency fasciotomy remain unclear. We reviewed the functional outcomes of a large group of patients who had undergone lower leg fasciotomies after revascularization for limb ischemia.

**Methods:** A retrospective medical record review included all patients treated with fasciotomies at a large level 1 trauma center between April 2016 and February 2021. The following clinical data were extracted: patient demographics, length of hospital stay, type of ischemia, immediate vs delayed fasciotomy, wound management, amputation, readmission